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Impact of Functional Capacity on Nutritional Status of Hospitalized Elderly in Qazvin, Iran

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Abstract

Background: Lack of independence and unwanted dependence on others for activities of daily living (ADL) and decreased functional capacity affect nutritional status of the elderly.
Objectives: The aim of this study was to determine the impact of functional capacity on malnutrition status in hospitalized elderly patients in the Qazvin city of Iran.
Patients and Methods: This cross sectional study was conducted on patients 60 years or older hospitalized in two teaching hospitals of Qazvin, Iran, from May to October 2011. The nutritional status was assessed using the mini nutritional assessment (MNA) questionnaire. Functional capacity of the elderly was assessed using self-report questionnaires of ADL and Instrumental Activities of Daily Living (IADL). Data were analyzed using the Chi-square test and logistic regression analysis.
Results: Of the 322 participant, 171 (53.1%) were male. The mean age was 70.36 ± 7.8 years. Based on MNA, 96 patients (29.8%) had normal nutritional status, 138 (42.9%) were at risk of malnutrition and 43 (13.4%) had malnutrition. Dependency on ADL and IADL was significantly associated with malnutrition and risk of malnutrition. In the logistic regression analysis, IADL was associated with malnutrition (OR: 1.19, 95% CI: 1.07 - 1.33; $P < 0.001$).
Conclusions: Risk of malnutrition as well as reduced functional ability was high among the hospitalized elderly of Qazvin. Nutritional status assessment of older adults is necessary, particularly when they are admitted to hospitals.

Keywords: Aged, Nutrition Assessment, Activities of Daily Living, Malnutrition

1. Background

The phenomenon of population aging is one of the most important economic, social and health challenges of the 21st century (1). Average annual growth of the elderly population in Iran was about 3.9%, between 2006 and 2011, which will reach 26% by 2050 (2). Life expectancy for Iranian males and females is estimated to be 72.2 and 73.9 years, respectively (3). Aging is associated with various physiological and psychological changes and makes older adults vulnerable to poor nutrition, which is followed by a higher risk of malnutrition (4, 5). Poor nutrition is associated with low quality of life, morbidities and higher mortality due to chronic diseases, sensory defects (vision or hearing loss), taking multiple drugs, poor socioeconomic status, physical disability, sedentary lifestyle and depression. All of these factors make older adults more likely to be malnourished and more prone to hospitalization (6-8). Malnourishment is a serious and common problem among older adults and can result in weakened physiological and functional conditions and physical performance (5, 9). Unintentional and unexplained weight loss is considered as a major indicator of malnutrition among the older population (10). Lack of independence and unwanted dependence on others for activities of daily living (ADL) as well as decreased functional capacity affect nutritional status of the elderly (4). Reduced functional capacity is defined as a defect in self-care skills, which, in many cases, can lead to prolonged hospital stays and increased mortality as well as high costs of care (11). Several studies have shown a close relationship between nutritional status and functional capacity, particularly among older adults (9, 12, 13). However, the current knowledge about the relevance of functional capacity and nutritional status is not enough for the Iranian population. Hospitalized olderly need more attention due to their morbidities and related disabilities. On the other hand, hospital admission as an access

point provides an opportunity for early identification and treatment of malnutrition. Evaluation of the nutritional status of elderly is extremely important considering the growing population of older adults in Iran, and lack of studies on the association of nutritional status and functional capacity of hospitalized olderly.

2. Objectives

The aim of this study was to determine the impact of functional capacity on malnutrition status in hospitalized elderly of Qazvin, Iran.

3. Patients and Methods

This cross sectional study was conducted on olderly patients hospitalized in the medical and surgical wards of two teaching hospitals of Qazvin from May to October 2011. The ethics committee of Qazvin University of Medical Sciences approved the study. All participants provided a written informed consent. Inclusion criteria were age ≥ 60 years and ability for verbal communication to answer the questions. Patients who had a history of severe mental diseases resulting in hospitalization within the last six months were excluded. The sample size was calculated using the following formula:

$$n = \frac{Z^2_{1-\frac{\alpha}{2}} P(1-P)}{d^2}$$

Considering Z as the statistic corresponding to the level of confidence, α: 0.05, precision (d): 6%, and prevalence of malnutrition (P): 55% (14), the calculated sample size (n) was 275. During the study period, all hospitalized patients that met the inclusion criteria (364) were selected to increase the study power. To avoid the influence of confounding factors such as changes in the patient's body mass index (BMI) due to hospital diets, treatment process and drugs, data collection was carried out during the first 24 hours after hospital admission. Demographic characteristics of the participants were recorded using their medical files. Two trained interviewers filled out the questionnaires. The nutritional status was assessed using the mini nutritional assessment (MNA) questionnaire (15). The MNA is a validated and widely used assessment tool that is effective for evaluating the nutritional status of older adults in various settings. The validity and reliability of the Persian version of this questionnaire have been previously confirmed by the study of Amirkalali et al. (16). The questionnaire consists of 18 items in four categories, including anthropometric data, general assessment, nutritional assessment and self-assessment. Scores of ≥ 24 are considered as normal nutritional status; 17-23 indicates the risk of malnutrition; and scores of < 17 are considered as malnutrition (15). Functional capacity of elderly was assessed using the ADL self-report questionnaire (17). Khoei et al. translated and validated these scales for the Iranian elderly population, previously (18). The ADL questionnaire includes questions about eating, putting on and taking off clothes, tasks related to adornment and grooming (such as combing hair, etc.), walking and mobility, and going to the bathroom and toilet. The instrumental activities of daily living (IADL) was assessed using six questions about using the telephone, shopping, preparing meals, housekeeping and laundry, taking medications as prescribed (i.e. self-medicating), and managing money. These activities are rated on a three-point scale, ranging from independent (without help 1) to relatively dependent (with a little help 2); to completely dependent (not able to do 3). Higher scores indicate greater dependence (19). Data were recorded as mean ± standard deviation (SD) or as numbers (percentages). Categorical variables were analyzed using the chi square test. Association of MNA scores, ADL and IADL was assessed using the Spearman correlation coefficient. A logistic regression analysis was used to examine the association of nutritional status and ADL and IADL. Scores of ≥ 24 were considered as normal nutritional status and scores of < 24 were considered as abnormal nutritional status for logistic regression analysis. P values of less than 0.05 were considered significant.

4. Results

Of the 364 eligible patients, 322 patients participated in the study. Of these 322 participants, 171 (53.1%) were male, and 216 (67.1%) and 106 (32.9%) were hospitalized in internal wards and surgical wards, respectively. The mean age was 70.36 ± 7.8 years and the mean BMI was 25.88 ± 4.88 kg/m^2. Based on MNA, 96 patients (29.8%) had normal nutritional status, 138 (42.9%) were at risk of malnutrition and 43 (13.4%) had malnutrition. Characteristics of the study subjects by nutritional status are shown in Table 1. Malnutrition was associated with a BMI of lower than 19, severe loss of appetite, weight loss in three months, and inability of motion (P < 0.001). The functional autonomy status for ADL and IADL among hospitalized elderly by nutritional status is shown in Tables 2 and 3. Overall, 29.2% of the participants had complete or some dependency for at least one component of the ADL while 86.6% needed assistance for at least one component of the IADL. Furthermore, 61.01% of the participants had complete or some dependency on meal prepation. Dependency was significantly associated with malnutrition and risk of malnutrition.

There was a negative significant correlation between MNA scores and ADL scores (r: -0.405, P < 0.001) and IADL scores (r: -0.492, P < 0.001). In the logistic regression analysis, IADL was associated with malnutrition. The higher the dependency for IADL, the higher the probability of malnutrition (OR: 1.19, 95% CI: 1.07 - 1.33; P < 0.001). However, there was not such association between ADL and malnutrition. Upper BMI (OR: 0.869, 95% CI: 0.809 - 0.934; P < 0.001), the ability to leave home (OR: 0.122, 95% CI: 0.052 - 0.291; P < 0.001), and independent living (OR: 0.424, 95% CI: 0.207 - 0.869; P = 0.019) were protective factors of malnutrition.